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The JOURNAL of GEOGRAPHY

VOLUME XLIV DECEMBER, 1945 NUMBER 9

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Miss Anderzhon teaches in the Horace Mann Junior High School, Oak Park, Illinois, and is a member of the Editorial Board of the Illinois Bulletin of Geography. She did her graduate work at the University of Chicago and Harvard. This is the third in a series of four units which Miss Anderzhon has prepared for JOURNAL.

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VOLUME XLIV DECEMBER, 1945 NUMBER 9

"THIS HEMISPHERE"

S. W. BOGGS
Department of State, Washington, D.C.

The world is round. Maps are flat. We use globes very little, and not effectively. We use maps a great deal but not intelligently.

All hemispheres are round—on the earth itself and therefore on the globe. A hemisphere is usually mapped within a circle which

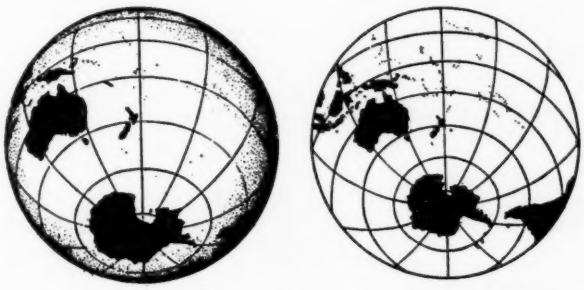


FIG. 1. The water hemisphere. The hemisphere with the maximum water area and minimum land (88.8 per cent water, 6.2 per cent land, 5.0 per cent Antarctic icecap). About 6 per cent of the world's population lives here on 12 per cent of the world's land area (excluding Antarctica). On the left it is shown on the orthographic projection (that is, in perspective, with parallel rays of vision, like the sun's rays lighting the earth), the earth's surface receding near the edge; it is shaded here as if lighted directly in front. On the right it is "flattened" on the azimuthal equal-area projection. No part of the United States lies within the "water hemisphere."

faintly suggests the roundness of the whole world. A hemisphere is mapped in perspective (on the "orthographic projection") or more usually it is flattened after the manner of other maps—to represent areas truly or to confer upon the map some other desirable property. However, a hemisphere may be mapped within a rectangle or within many other geometric limits.

Americans frequently speak of "this hemisphere," meaning *the*

hemisphere in which the United States finds itself. They will better grasp the "global" relationships of the United States if they get a true mental picture of some of the many hemispheres in which the United States is located.

Hemispheres are infinite in number. Rest a transparent glass or plastic geographical globe on its south pole, half fill it with water exactly to the line of the equator, and seal it shut. Roll it into any position whatever; the bottom hemisphere will be filled with water and the top with air. The water level will always be a plane passing thru the center of the globe. The visible waterline will invariably be a "great circle"—a circle greater than any that can be described on the globe with a radius either less or more than the interval between one of the poles and the equator. Any two points on the earth's surface lie on one of these great circles—which constitutes the shortest route between them. Therefore, with surface features and weather permitting, great-circle routes between ports are naturally preferred by both steamships and airplanes.

I. The Northern Hemisphere

Any hemisphere may be identified and distinguished from all other hemispheres by its center point. Conversely, any point on the

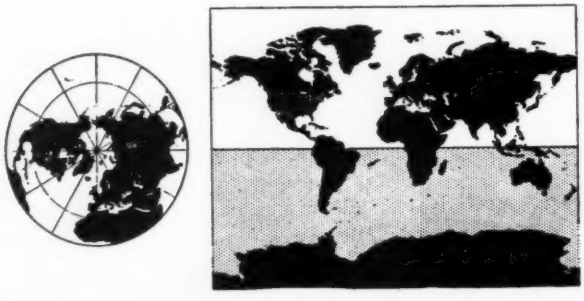


Fig. 2. The northern hemisphere. The center is the North Pole, and the limiting great circle is the equator. The unshaded portion of the world map on the Miller projection corresponds to the hemisphere map at the left.

earth's surface is the center of a hemisphere which somewhat differs from all other hemispheres.

The United States is in the northern hemisphere, nearly half way between the equator and the North Pole, the 45th parallel of latitude coinciding with the northern boundary of New York State and with the Montana-Wyoming boundary.

The northern and southern hemispheres are the only hemispheres whose common boundary has any geographic significance. The seasons on opposite sides of the equator are antipodal, since it is summer in one when it is winter in the other.

Approximately 37,570,000 square miles (74 per cent of the world's 50,973,000 square miles of land area, exclusive of the ice-caps in Greenland and Antarctica), with a population of approximately 1,968,577,000 (constituting 91 per cent of the world's population of approximately 2,166,879,000), are to be found in the northern hemisphere. This hemisphere includes all of North America, Europe, and continental Asia, part of South America (17 per cent of its area and 15 per cent of its population), and part of Africa (67 per cent of its area and 68 per cent of its population).

II. THE SO-CALLED "WESTERN HEMISPHERE"

The concept of the "western hemisphere" or New World, comprising the American continents and islands, is very important,

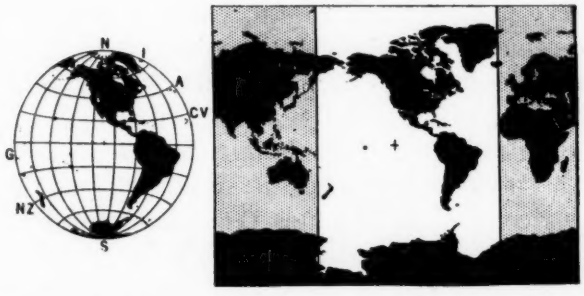


FIG. 3. The map-maker's conventional "western hemisphere." The meridians 20° W. and 160° E. of Greenwich constitute the conventional limit of this hemisphere. The center is a point in the Pacific Ocean, on the equator, in 110° W. longitude, about 1,250 statute miles from the nearest point on the American continents, near Acapulco, Mexico, and more than 2,000 miles from the Panama Canal. The unshaded portion of the world map comprises this conventional "western hemisphere," and the shaded portion is the "eastern hemisphere." The letters around the circular hemisphere map signify: N, North Pole; I, Iceland; A, Azores; CV, Cape Verde Islands; S, South Pole; NZ, New Zealand; and G, Guadalcanal Island in the Solomon group.

both historically and politically. But this so-called "western hemisphere" is inadvisedly called "western" and does not deserve the appellation "hemisphere."

Because the Americas are west of Europe, Europeans and their descendants on this side of the Atlantic frequently call them "the

western hemisphere." The American continents are, however, east of Asia and of the whole of the so-called "eastern hemisphere" quite as much as they are west of it. This is shown on Figure 3. If the Chinese or Japanese had crossed the broad Pacific and had discovered the Americas they might have called these continents the "eastern hemisphere."

The Americas comprise only about 30 per cent of the world's land area and contain about 13 per cent of its population. As may be seen in Figure 4, the American continents and islands, including Greenland, lie wholly within one half of a certain hemisphere, and in that quarter-sphere there is twice as much water as land. The Americas therefore scarcely deserve to be called a "hemisphere."

"Western" hemisphere suggests limiting lines running due north and south, namely meridians. Now it happens that map-makers make many maps of the Americas within circular limits which embrace, therefore, a hemisphere. Merely for convenience and economy, they utilize limiting lines, a pair of meridians 180° apart, that would appear on the map anyway. So they take a meridian between Africa and South America, usually 20° west of Greenwich (if that is used as the prime meridian for the map), and then necessarily employ its anti-meridian, 160° east longitude.

The center of this conventional hemisphere is in the Pacific Ocean, on the equator, in 110° W. longitude. It is about 1,250 statute miles from the nearest point on the American mainland, west of Acapulco, Mexico, and 1,850 miles from the nearest point in the United States, near Brownsville, Texas. Clearly this center point is without geographic significance.

The limiting meridians of this so-called "western hemisphere" have no political, historic, geographic, or economic significance. If we were to follow the ancient custom of "beating the bounds" (easily, in an airplane today) we would traverse open ocean most of the time. Going north on the 20th meridian we would cross part of Antarctica, Iceland, and a mere northeastern tip of Greenland; going south on the 160th meridian we would cross the eastern tip of Siberia including the Kamchatka peninsula, the island of Guadalcanal in the Solomons, and part of Antarctica. Within this hemisphere are found the Cape Verde Islands, the Azores, the western third of Iceland with its capital city, almost all of Greenland, eastern Siberia, thousands of Pacific islands, all of New Zealand, and a large part of the Antarctic continent—in addition to North and South America. The Atlantic and Pacific islands and the eastern

portion of Asia within this hemisphere comprise only 1.1 per cent of the world's land area, with 0.5 per cent of its population.

This hemisphere, mapped by itself, induces complacency in Americans. It embraces almost the maximum area of ocean in any hemisphere which contains all of North and South America. Like an ostrich with its head in the sand, we avoid seeing the other half of the world, much of it surprisingly near.

People in the United States sometimes identify this so-called "western hemisphere" with the Monroe Doctrine. The term "western hemisphere," however, was not employed in the message of President Monroe to the Congress in 1823. The terms "the Ameri-

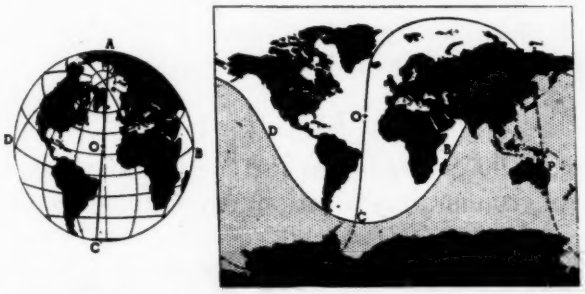


FIG. 4. Hemisphere centered at 28° N., 31° W. The straight line AOC thru the center divides it into quarter-spheres. The western quarter-sphere contains all of North and South America, including Greenland, and a portion of Siberia. The eastern quarter-sphere comprises all of Europe and Africa (except a small part of Madagascar) and about 42 per cent of the area of Asia. The limit of the hemisphere, ABCDA on both maps, is a complete great circle (like the equator or any meridian circle) while the line AOC which divides it into halves is half of such a great circle, the other half being APC as shown in a dotted line on the world map.

can continents" and "this hemisphere" were used, evidently synonymously; Russia was in mind at that time and certainly no part of Siberia was thought of as part of "this hemisphere." Neither were New Zealand, part of the Solomon Islands, Samoa, the Fijis, and other Pacific islands, nor was any part of Antarctica (of which they knew almost nothing) contemplated when men spoke of "the American continents" and "this hemisphere" in 1823. Would it not be fatuous, indeed, to regard the meridians of 20° W. and 160° E. longitude as significant in relation to American policy, and therefore to have one policy with reference to the eastern portion of the island of Guadalcanal and another toward the western portion? Surely, a saner and more realistic understanding of geography than that is needed!

III. A More Significant Hemisphere for Americans

A hemisphere centered in the north Atlantic Ocean, at 28° N. and 31° W., is much more significant for all people in North and South America than is the map-maker's "western hemisphere" centered in the Pacific on the equator. This hemisphere, illustrated in Figure 4, includes all of the Americas except the westernmost Aleutian Islands, and all of Europe and Africa and more than 40 per cent of Asia. Altogether it comprises 76 per cent of the world's land area, with fully 50 per cent of its population.

This might be called a "western-civilization hemisphere," since it embraces Europe and the Americas (but with all of Africa and much of Asia besides). Only Australia and New Zealand are outside its bounds. Both history and geography make this hemisphere important to peoples on both sides of the Atlantic.

IV. The Land Hemisphere

Geographers have made careful determinations to ascertain which hemisphere contains a larger percentage of land area than

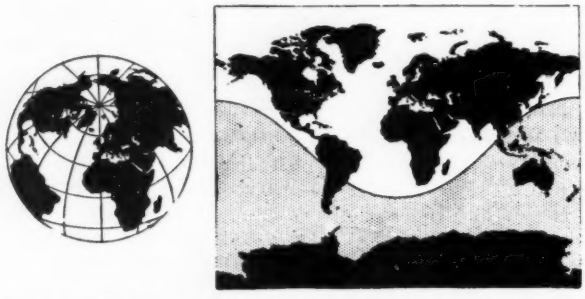


FIG. 5. The land hemisphere. The hemisphere with the maximum land area (45.6 per cent land, 53.7 per cent water, 0.7 per cent Greenland icecap). About 94 per cent of the world's population lives here on 88 per cent of the world's land area. On the world map, the shaded area is the water hemisphere (see Figure 1).

any other. It has been found to have its center in western France, near Nantes, in about 47°13′ N. latitude, 1°32′ W. longitude. On its 44,904,000 square miles of land (88 per cent of the world's land area) live about 2,035,000,000 people (94 per cent of the world's population). In addition to all of Europe and Africa and North America, the land hemisphere includes nearly 88 per cent of Asia's territory and nearly 92 per cent of its population (the Philippines, Netherlands Indies, British Malaya, and parts of French Indochina and Thailand being excluded); the land hemisphere also embraces

about 79 per cent of the area of South America with 73 per cent of its population.

This hemisphere includes all of the United States and all of its non-contiguous territories except those in the Pacific. The United States is located near the edge of the hemisphere. Considering the vast area and the enormous population, the resources and the industrial development, the land hemisphere may be regarded as the most important hemisphere. The advantages of central location, particularly in a military sense, have not been overlooked by Germany. Commercially the situation is different, in part because ocean transport costs roughly only a tenth as much a ton-mile as railroad transport.

From the center of the land hemisphere, in western Europe, one can account for the origin of major regional terms which Americans have inherited and still use. To people in western Europe, China and Japan and the rest of eastern Asia is the "Far East." But for Americans it is the nearest land to the west, and is reached by starting north and west to the north Pacific, or by air over Alaska—it is our "Near West." For the Chinese it is neither east nor west. The Chinese name for China is "Middle Country" or "Middle Flowery People's Country"—just as the peoples of southern Europe regarded their sea as the middle of the land area, the Mediterranean. Objective geographic terms, such as "the Americas" or "the American continents," and "eastern Asia" or "the western Pacific," are accurate and of universal applicability, since they are acceptable to the people who live in the regions concerned.

V. Hemisphere Centered within the United States

In all four hemispheres just described (Figures 2 to 5) the United States is found somewhere near the edge, or at least the center of the United States lies about half way between the center and the edge of the hemisphere. A hemisphere centered near the middle of the United States, in 40° N. latitude, 100° W. longitude (near Beaver City, Nebraska and Norton, Kansas), is illustrated in Figure 6.

This hemisphere fails to embrace the southern end of South America, but it includes all of Europe except the island of Crete, about 30 per cent of the area of Africa, and more than 10 per cent of the area of Asia; it includes all of the Arctic Ocean, a very large portion of the Atlantic Ocean, and an even greater area in the

Pacific. Asia and Africa are nearer to the United States than most Americans realize. Dakar, Moscow, and northern Manchuria are nearer to the center of the United States than is Buenos Aires. The actual "global" relations of the United States, which are remarkably different from the conceptions many people cherish, based on

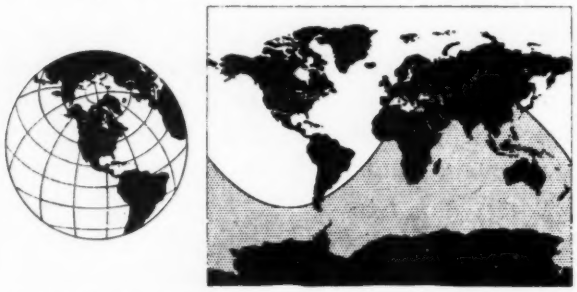


Fig. 6. Hemisphere centered near the center of the United States. A hemisphere centered at 40° N., 100° W., is shown here. Altho it does not include the southern tip of South America, it does include all of Europe, part of Africa, and, in Asia, part of Turkey, most of Russian Asia, most of Manchuria and Japan.

Mercator maps, have suddenly acquired heightened importance in these days of airplanes and radio.

VI. Hemisphere à la Carte for Americans

If Americans were curious to ascertain how much of the world can be included in some hemisphere that includes all of the United States (the 48 States and the District of Columbia) they would be greatly surprised. They can order almost any hemisphere they like *à la carte* in more than one sense. A series of hemispheres, with the United States at the very edge of each, reveals relations of this country to the rest of the world that few people appreciate. Three such hemispheres are illustrated below, in figures 7, 8, and 9.

(a) Northern boundary of the United States at hemisphere's edge. If the northern edge of a hemisphere is placed on the northwestern corner and the northeastern tip of the United States there will be included, in addition to all of the United States and a narrow strip of Canada, all of Mexico, Central America, the Caribbean, South America, Antarctica, New Zealand, a portion of Australia, and the tip of South Africa, still larger areas of the Atlantic and Pacific Oceans, and a portion of the Indian Ocean near the Antarctic continent.

(b) Atlantic coast of the United States at hemisphere's edge. If the northeastern and southeastern extremities of the United States are placed at the edge of a hemisphere, almost all of Canada, Labrador, and Greenland, all of Mexico and part of Central Amer-

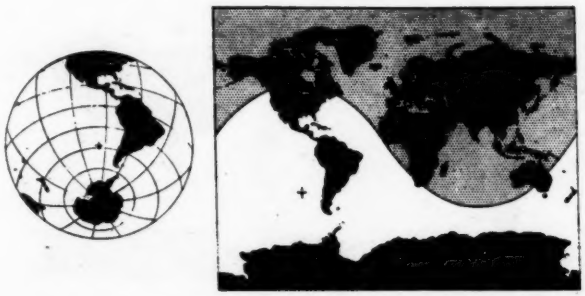


FIG. 7. Hemisphere with the northern limits of the United States at its edge. The center of this hemisphere is in the South Pacific, near 38° S. latitude and 98° W. longitude.

ica, a very great part of Asia and the northern tip of Europe, all of Australia and New Zealand, all of the Arctic, most of the Pacific, and the eastern edge of the Indian Ocean will be included.

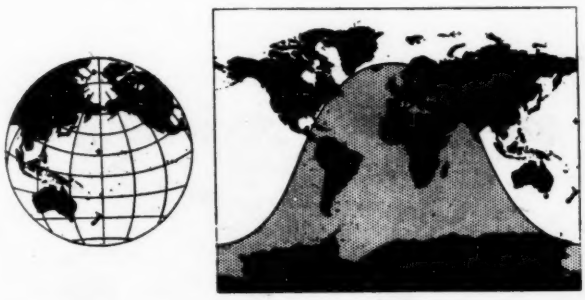


FIG. 8. Hemisphere with the eastern coast of the United States at its edge. The center of this hemisphere is in the North Pacific, near 24° N. latitude and 177° E. longitude.

(c) Southern boundary of the United States at hemisphere's edge. A hemisphere which has Brownsville, Texas, and San Diego, California, on its southern edge will include not only all of Canada, Alaska, and Greenland but also all of Europe, Africa, and Asia, except a small portion of the Netherlands Indies and large parts of the Atlantic, Pacific, and Indian Oceans.

(d) Sum of all hemispheres containing all of the United States.

Similarly, a hemisphere whose edge touches Key West, Florida, and Brownsville, Texas, embraces all of Europe and Asia and most of Africa, and the northern fringe of Australia. A series of hemispheres touching pairs of points of the Pacific coast of the United

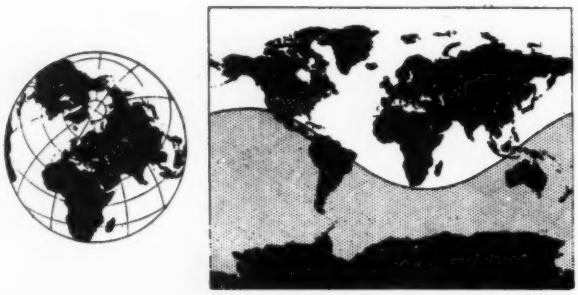


FIG. 9. Hemisphere with the southern limits of the United States at its edge. The center of this hemisphere is west of Moscow near 55° N. latitude and 35° E. longitude.

States will necessarily duplicate areas already included in hemispheres described above, because together they include all the land on earth except Kerguelen Island in the Indian Ocean (one of the world's most desolate spots), both polar regions, and all of the

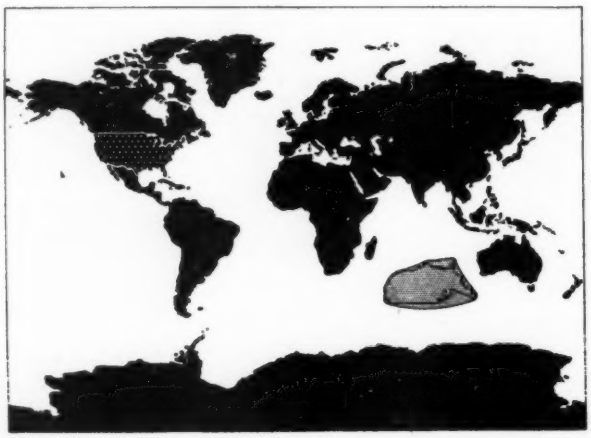


FIG. 10. The sum of all hemispheres containing all of the United States. The sum of the hemispheres shown in figures 7, 8, and 9, and of others that might be added in which points on the Pacific coast of the United States are on the edge of one or another hemisphere, is indicated by the unshaded area on this map. The shaded area in the Indian Ocean (about 4,180,000 square miles) is the only portion of the earth's surface which can not be included in some hemisphere that covers all of the United States. Kerguelen Island is the only land in that area, and it has no recorded population.

oceans with the exception of an area in the Indian Ocean which is not much larger than the United States. The limits of this excluded area comprise a series of great circles tangent to a mirror image of the United States in the South Indian Ocean.

The global relations of the United States are disclosed in a rather remarkable way by a series of hemispheres such as those shown above. When a person speaks of "this hemisphere" as the one in which the United States of America is located, one may well inquire, "Which hemisphere?"

OBSERVING THE POSITION OF THE SUN THRU A SYSTEMATIC RECORDING OF SHADOWS

MAMIE L. ANDERZHON
Oak Park, Illinois

ASSIGNMENT

Recording the change in the length of shadows thru a cycle of seasons, and relating this change in the length of shadows to where we see our sun thruout the cycle of seasons.

EQUIPMENT

1. Yardstick
2. Wrapping paper (length varies with the length of the shadow each month)
3. Pencil, paper
4. Scissors
5. Lettering pen and ink

DIRECTIONS

This is an activity we shall repeat:

1. Every month of the year.
2. On the same day, preferably the 21st of the month or as near that date as possible.
3. At the same time of day, preferably 12 o'clock noon.
4. Using the same student (preferably the shortest one in the class, you'll see why in December).
5. At 11:45 measure the length of the shadow of the student selected to have his shadow made each month.

6. Cut wrapping paper the length of the shadow plus 6 or 8 inches for good measure.

7. Letting the student who is having his shadow drawn stand on one end of the paper, another student will trace the shadow with chalk or pencil.

8. Cut out the shadow and carefully letter the following data on the silhouette as this information will be useful in later comparisons.

a. Date shadow is made.
b. Time of day the shadow is made.
c. Height of the student whose shadow is being made, in feet and inches.
d. Length of the shadow in feet and inches.
e. Is the shadow longer or shorter than the student?
f. Angle of the sun.
g. Number of daylight hours on this day and number of hours of darkness. (This information can be secured from the weather report found in the daily newspaper.)

9. Since this assignment is carried out once each month for a year it is best to plan a place for hanging the shadow silhouettes so that the monthly change can be observed, and compared.

Student's Summary of Recorded Data Related to Shadows

Summarize your data to include the following:

1. Name of your community where you are making the observations.

2. Details of arrangements such as date, hour of the day and months for which the recordings were made.

3. How does the length of shadow compare with the length of daylight hours. The longer the daylight the (longer or shorter) the length of shadow.

4. The longer the shadow the (higher or lower) the noon day sun for that day.

5. During what months do the shadows tend to be approximately the same length? Why?

Write the conclusion to your observation in the most precise language you can so you cannot be misunderstood.

You may wish to observe the change in the length of shadow each hour for a day. September 23, December 21, March 21 and June 21 are good times for making such observations.

Such an observation might illustrate Robert Louis Stevenson's "My Shadow."

> I have a little shadow that goes in and out with me, . . .
> The funniest thing about him is the way he likes to grow—
> Not at all like proper children which is very slow;
> For he sometimes shoots up taller like an Indian-rubber ball,
> And he sometimes gets so little that there is none of him at all.

If desired a stationary short pole can be used instead of a student for the entire observation. (There are accounts of how the Egyptians, Incas and Mayan peoples observed the positions of the sun thruout a cycle of seasons. They often used a fixed pole. You may want to explore some of these sources.)

A DAILY RECORD OF THE DAYLIGHT AND DARKNESS

Assignment

A chart showing the change in the length of daylight and dark each day of 24 hours thru a cycle of seasons.

Equipment

1. Wrapping paper or cardboard (12 sheets, one for each month cut to convenient size, possibly 36 inches (vertically) by 30 inches (horizontally)
2. Weather reports from the daily newspaper showing the hour of sunrise and sunset for the day.
3. Lettering pen and ink

Directions

1. At the top of the sheet for each month record:
   a. Hemisphere (north or south)
   b. Location of observation (name of place and geographic index, namely latitude and longitude)
   c. Season (spring, summer, autumn, or winter)
   d. Month and year
   e. In a vertical column list the number of days for the month.
2. Arrange horizontally across the top of the sheet:
   a. Hour of sunrise
   b. Hour of sunset
   c. Number of hours and minutes of daylight
   d. Number of hours and minutes of darkness
   e. Minutes change from the day before, if more light place a plus before the number of minutes if less place minus
3. The change and record can also be kept either as a bar graph

or better, 2 circles each divided into 12 parts as a face of a clock or 1 circle divided into 24 parts similar to a 24 hour clock.

Student's Comparisons

As you add to your records from month to month what do you observe concerning: 1) the comparison of the length of the shadow with the length of the daylight hours? 2) The length of daylight as related to the position of the noonday sun?

A GEOGRAPHIC SURVEY OF CACHE VALLEY, UTAH

VIRGIL R. BAKER
University of Idaho

Cache Valley is a well-defined geographical entity. It lies as a comparatively narrow intermontane basin between the Bear River and Wellsville mountain ranges both of which form an integral part of the much larger Wasatch System. Its rich agricultural lands have produced food crops for many years, and its gardens and orchards have yielded vegetables and fruits for the markets in near-by Logan and other Cache Valley towns. Today the valley's desire to attain self-sufficiency has been a boon to agriculture and industry in Utah, and the Cache Valley region has contributed its share to state prosperity.

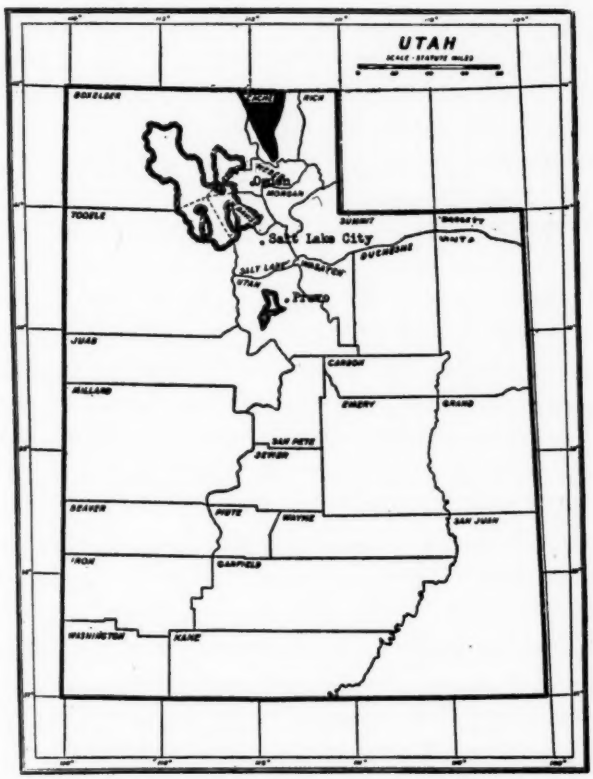
Thruout the well-defined Cache Valley region a cultural landscape has developed somewhat differently from that in adjoining regions.

THE NATURAL LANDSCAPE

Salient Features of the Region. Cache Valley is situated in the northern part of Utah and extends into Idaho. In shape it is an irregular oval, with its long axis north and south. The valley attains its maximum width, approximately 20 miles, at the Utah-Idaho state line. From this point the valley narrows both north and south. The segment which lies in Utah is about 44 miles long and that which extends into Idaho is about half that length. The average width is about 10 miles.

Cache Valley is one of the many subsidiary valleys which are

included within the Basin and Range physiographic province. Formerly it was occupied by prehistoric Lake Bonneville, a Quaternary lake which covered an extensive area in the intermountain region. During the time that Lake Bonneville occupied parts of the Great Basin, water covered Cache Valley to a depth of about 900 feet at the highest level of the lake and hundreds of feet of sediment



were deposited over its bottom and at the mouths of the larger canyons which enter the valley. The disappearance of the lake exposed a very gently undulating surface which is now known as Cache Valley.

Cache Valley is one of the most fertile valleys in the state of Utah. Its relatively flat-bottomed floor is about 4400 feet above sea level and merges with the gentle slopes of the foothills of the nearby mountains. The valley is marked by a wide meander belt of the Bear River along which numerous oxbow lakes are observed. The east side of Cache Valley is bounded by the high and deeply fur-

rowed Bear River Range which comprises a large catchment basin for the excellent supply of pure water which enters the valley. On the southwest, the valley is bordered by the Wellsville Mountains, a narrow but high extension of the Wasatch Range which merges imperceptibly with the Bear River Range at the south end of Cache Valley, thus completely enclosing the valley at its southern end. The eastern front of these mountains is very steep with many precipitous cliffs protruding from its face. This steep face is cut by narrow gorge-like canyons which head high up against the north-south ridge. North of the Wellsville Mountains on the northwest side of the valley are the isolated Clarkston Mountains.

The foothills and the lower slopes are marked by numerous old lake terraces or deltas varying in width from a few rods to more than a mile. These are conspicuous from all parts of the valley and mark the different levels of old Lake Bonneville.

From the west face of the Bear River Range, east of the city of Logan, a series of deltas descends to the valley floor in a step-like profile. It is upon the most pronounced delta that the Utah State Agricultural College is located. Logan, the county seat and largest city of Cache Valley, is situated on different delta levels. Most of the cities and towns of Cache Valley are located on the old deltas formed in the old lake.

The most important streams enter the valley from the north and east. Bear River, entering from the north, receives the entire drainage of the valley. The two most important streams which enter the valley from the east, and which are extensively utilized for irrigation purposes, are Logan and Blacksmith Fork rivers. The average annual flow of these streams is 270,000 and 160,000 acre feet respectively. The drainage leaves the valley thru a gorge between the Wellsville and Clarkston mountains. The valley is well supplied with water for household and irrigation purposes. That portion of it included within a line drawn from Smithfield west to Bear River, then to Mendon, Wellsville, Hyrum, Logan, and back to Smithfield, lies within an artesian basin the center of which is west of Logan.

Climate. Cache Valley has the invigorating climate characteristic of the mountain and plateau region of western United States. The spring and fall months are very pleasant with mean temperatures of 45.7°F. and 49.9°F. respectively. During the afternoons of the summer months, comparatively high temperatures prevail, but the difference between the actual and sensible temperatures is

so great that the days are not oppressive and the nights are always cool. The winters are generally cold and dry, the mean temperatures for these months being 25.3°F. The mean annual temperature for the valley as a whole is 48.7°F.; the highest recorded temperature is 100°F. and the lowest −25°F., giving a range of 125°F.

Included within the semiarid belt, Cache Valley has an average annual precipitation of about 16 inches. Rainfall is greatest during the spring months with a total of 6.12 inches, and least in the summer, when only 2.11 inches falls, practically all in the form of thunder storms. The fall and winter seasons have about the same amount, 3.62 and 3.84 inches respectively. In general the rainfall is quite uniform over the valley, but is somewhat greater along the east and south sides. Because of the relatively uniform distribution of precipitation, it is seldom necessary to irrigate in the spring to cause seed germination or to bring seeded crops up. Snowfall over the valley varies considerably, ranging from a few inches to two feet or more. On the surrounding mountains, however, snow falls every month with the exception of June, July, and August. It disappears from the mountain peaks by the middle of July, altho occasionally some snow remains the entire year. Hailstorms occur very rarely and are of local extent. Much fog occurs during the winter season, but a moderate to heavy dew occurs thruout much of the growing season, which is advantageous in a region of such scant rainfall.

The amount of rainfall and its distribution are favorable for the production of dry-farm crops, such as grains, alfalfa, and alfalfa seed.

The large number of warm, uniform, clear summer days hastens the growth and maturity of crops. They are too cool for the profitable production of corn on a large scale. The average date of the first killing frost in the fall is October 8 and the last in spring is May 10. The growing season varies rather markedly within the valley, the lower lands having considerably shorter growing seasons than the valley slopes. The average growing season at the College Station in Logan, which is located on a bench with favorable air drainage, is 155 days, while three miles to the southwest at the sugar factory, which is in the bottom of the valley, the average growing season is 126 days; at Richmond, fifteen miles to the north, it is 120 days. Therefore, in any interpretation of data on growing season, the location and elevation of the station in relation to the surrounding area should be given consideration.

The cold winds come from the north and northwest. The prevailing winds are from the southwest and are strongest during the late spring and summer months, when they are warm, and if prolonged for several days usually bring rain. Frosts are less likely to occur around the mouths of large canyons, such as Logan Canyon, than farther out on the valley floor. Such places are especially favorable for the culture of the more tender fruit and truck crops. The dry summer winds cause a high rate of evaporation, and this emphasizes the necessity of thoro cultivation of the soil to conserve moisture and prevent the rise and accumulation of alkali.

The climate of the valley is favorable for the growing of the more hardy varieties of cherries, plums, apples, and pears. Only in a few small areas lying within the range of canyon breezes, can peaches and apricots be produced, and even in such places the crops are uncertain and the trees subject to more or less damage by the low winter temperatures.

Natural Vegetation. With the exception of the mountain tops, which are generally moist, the Cache Valley region experiences a marked summer drought, during which temperatures are high and evaporation great.

Those portions of the mountains immediately bordering the valley are treeless, except for small groves of pine, quaking aspen, and maple in the deep recesses and on the well-protected northern slopes. Facing the valley the mountain slopes are more rugged and are covered with a thin mantle of soil which supports a moderate growth of cedar, sage brush, and a heavy carpet of grass.

In the valley the vegetation along the streams consists chiefly of willow, birch, and cottonwood; otherwise the valley in its natural state was treeless. Striking features of this landscape are the numerous Lombardy and Carolina poplars, planted in long, straight rows around the towns and villages. Rows of poplars in many places mark farm boundaries. On the valley floor, low-lying areas where moist and free from alkali, are covered with a heavy growth of grass; those that are not so well-drained support at best a moderate to scant growth of salt grass and greasewood and in some places are barren.

THE CULTURAL LANDSCAPE

The intimate relationship between the use of the land and the physical setting is a result of years of human occupation. Changing

times, with their attendant changes in economic conditions, scientific knowledge, and social stability, have brought about changing land-use patterns in the valley. Today a better adjustment between the activities of man and the natural environment has been achieved than has been possible in the past.

Agriculture. About 30,000 persons live in the Cache Valley region, approximately ninety percent of whom are engaged in agriculture. Most of these work small holdings.

The agricultural products of the valley may be classed as food crops and feed crops. The food crops are the most important. In general, the 4700-foot contour line marks the upper limit of agricultural production.

The agricultural lands of this region are the valley floors of prehistoric Lake Bonneville. Along the base of the mountains are bench lands—remnants of the old lake deltas—the soils of which are well-drained and frequently gravelly. Just below these is a belt of gently sloping fertile loam soil which constitutes the greater portion of the cultivated lands. The lowest parts of the valley contain heavy soils, many of which are poorly drained and alkaline.

In the Cache Valley region, both dry and irrigation farming are carried on extensively. The lands above the existing canal systems, usually too uneven for irrigation, are used for dry farming.

Nearly all of the dry-farm land in Cache Valley is used for the production of winter wheat, the yield being about eighteen bushels per acre. The western margin of the cultivated land in the valley contains the principal dry-farm wheat areas. The alternate crop fallow system is almost universally followed. Dry-farm alfalfa, some potatoes, and dry beans are also grown on small tracts of land along the foothills, particularly those in the southern part of the valley.

A large part of the wheat grown in the dry-farm area of Cache Valley is transported to Ogden. Transportation facilities to Ogden from the dry-farm areas are good, either by rail or by truck, altho roads to some parts are not open during the winter.

Under irrigation sugar beets, alfalfa, small grains, potatoes, sweet corn, and in favorable localities bush and vine fruits, truck crops, and tree fruits yield excellent returns. All of these find a ready market in the cities and towns of the valley.

The dairy industry, tho of local importance, constitutes an important income to the farmers of the valley. Dairy farms are local-

ized to some extent in the district between Wellsville on the south and Richmond on the north. Cash-grain and crop-specialty farms, however, are situated in various localities thruout the valley.

A typical farm in the irrigated sections of Cache Valley consists of a town lot and one or more small tracts of farming land outside the town. Thus, an individual farmer may operate a pasture in the lowlands, a field on a valley slope, and an orchard or vine fruits on a bench. Consequently, even if the entire bench is in fruit, the valley slope a truck-crop area, and the lowlands in dairy pasture, the farmer is in no sense a specialized truck gardener, orchardist, or a dairyman.

The typical irrigated farm is family-sized or even smaller so that most of the work is done by the farmer and his family. The average farmer keeps several cows and a few chickens and has a considerable portion of his crop land in alfalfa, the remainder being divided among several crops. The farm labor is rather evenly distributed thruout the spring, summer, and fall seasons, while in winter work consists chiefly of caring for livestock.

Industry. Altho about ten percent of the people in the Cache Valley region are engaged in industry, and despite the fact that the value of agricultural products is greater than that of industrial, manufacturing and processing have an importance which few realize.

Processing of agricultural products has attained considerable importance. Two beet sugar factories are located within the valley —one at Logan and one at Lewiston. Smithfield is the center of a large Del Monte pea-canning establishment which is ideally situated in the heart of the pea-growing district of north-central Utah and southern Idaho. The valley also supports four milk condenseries and several dairies all of which have a surplus of dairy products for sale outside of the valley.

Various small industries afford a livelihood for a small number of people. Flour mills, meat-packing plants, knitting factories, brick factories, and lime kilns are all based on the local resources and serve a local market.

Power plants for the generation of electricity are located near points where Logan and Blacksmith Fork rivers emerge from the mountains. These together with smaller local plants supply cheap power and lighting for the valley and outside points.

The consolidated position of irrigated lands and the presence

of many small industrial activities of the valley, together with extensive railroad facilities, good highways, and the relatively large urban population provide market outlets equal to those of any other intermontane valley in Utah. The urban population furnishes a market for considerable farm produce grown within the valley, particularly the more perishable products, and the organized markets in the larger towns facilitate shipment of agricultural products.

The Transportation Pattern. Transportation facilities in the Cache Valley region are good. The transcontinental railroad system has avoided the region, so that its isolation from adjacent valleys and the rest of the state is notable.

The main line of the Oregon Shortline Railroad enters the valley thru Bear River Narrows and passes north along the west side of the valley. A branch line of this railroad from Cache Junction passes around the south and east sides of the valley and another branch line of the same road goes directly from Cache Junction to Logan. An electric interurban car line, the Utah-Idaho Central Railroad, connects Logan with Preston, Idaho and also passes south from Logan thru Hyrum, Wellsville, and Mendon before leaving the valley at the latter town for Brigham City and Ogden. These lines together with two paved highways afford good passenger and freight facilities for the entire valley, altho some communities, including Paradise, Newton, and Clarkston, are several miles distant from stations.

Settlements. Cache Valley was first visited by white settlers in 1847, but it was not until the advent ten years later of Mormon pioneers that active development began. The Mormons later were attracted to the valley by the abundant supply of good water and the fertility of the soil. Development was slow, however, until the coming of the railroad in 1873. Since 1870 the population has grown steadily and in 1940 was 29,797 or 25.4 persons per square mile.[1] From first appearances, the valley seems to be sparsely settled, owing to the communal system of the people. Nearly ninety percent of the inhabitants live in towns or villages, and about the same number follow agricultural pursuits.

The population is mixed, consisting principally of Scandinavians, English, and Germans. A considerable number of the older

[1] These figures represent approximately the population of Cache Valley, as practically all the inhabited region is included within this area.

people are foreign born. About ninty-five percent of the people of Cache County are members of the Latter Day Saints Church. Because of the influence of the Church, the people maintain a high standard of living, are thrifty and prosperous, with larger families than would be found in a comparable community elsewhere.

Logan, a city of about 12,000 people, is much the largest community of the Cache Valley region and is the county seat of Cache County. The city is laid out according to the traditional Mormon plan, with wide streets and long city blocks. It is modern and clean, with well-kept lawns and gardens. The city owes a considerable part of its activities to trade within the valley. Among the activities closely related to the conditions of the surrounding country, the retailing of supplies of all kinds are of importance, the city supplying the villages and towns of the entire valley. There is also an important sugar beet and dairy industry based on the supplies of products from farms in near-by areas.

The selection of Logan as the site for the Utah State Agricultural College and one of the few Mormon Temples has resulted in prominently identifying the city as the educational and religious center of northern Utah as well as its economic focal point. This has aided in furthuring the unity of the Cache Valley region.

The towns located along the south and east sides of the valley are mainly sugar beet and dairy centers and considerable fruit is grown locally. The west side is important for its grain and alfalfa production. Lewiston, Trenton, and Benson lie in excellent potato and sugar beet districts.

The influence, therefore, of the natural landscape may be seen in the location and alignment of the cities and towns and of the distribution of the crop-specialty and dairy farms; the influence of the cultural landscape may be seen in the thriftiness of the people and their high standards of living.

THE CLIMATES OF THE AMAZON LOWLAND

BENJAMIN MOULTON
Indiana University

The location of the Amazon Lowland in the Doldrums determines to a large degree the climatic types experienced in the area. Köppen divided this Lowland into two climatic zones. The recently issued maps of the Climatology Unit of the Quartermaster Corps, which gives in greater detail the climatic characteristics of the Amazon Lowland, indicates three climatic types, each of which

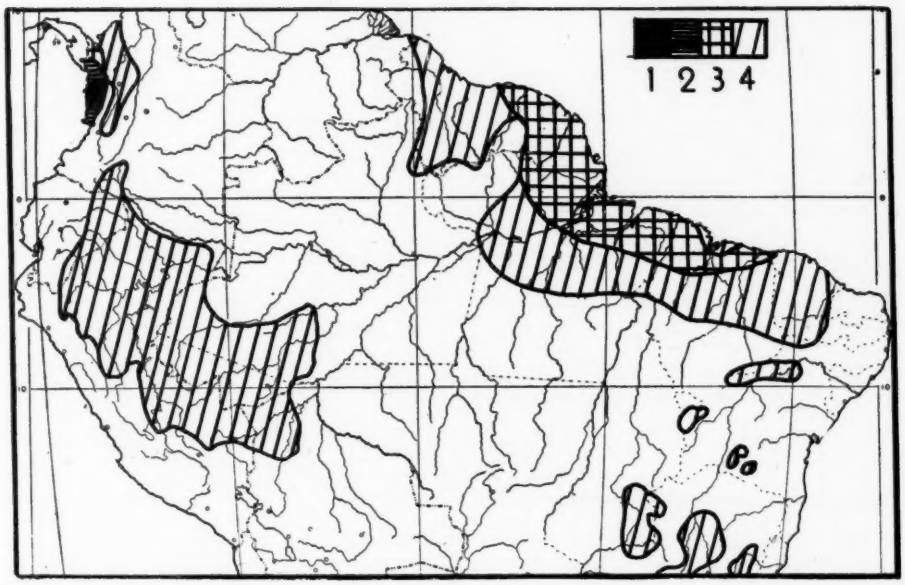


FIG. 1. The Distribution of the Hot and Wet Climatic Type in the Amazon Lowland and Adjacent Territory.
1. Areas Hot and Wet Thru the Year.
2. Areas Continuously Hot and Wet Five to Eleven Months.
3. Areas Continuously Hot and Wet Three or Four Months.
4. Areas Continuously Hot and Wet One or Two Months.

has average temperatures of 68°-86°F. per month. The distinguishing characteristic is the amount of precipitation. The types are: Hot and Wet (with precipitation of over 12″ per month), Hot and Humid (with precipitation ranging from 3″-12″ each month), Hot and Dry (with precipitation less than 3″ each month). These temperatures are the highest monthly averages in South America.

There are no Very Hot climates in South America. (In Southwestern United States, temperatures average above 86°F. per month for three or four months.)

The climates of the Amazon Lowland are continuously hot but not so monotonously wet, humid, or dry. The fact that these climatic types exist is of extreme importance to the inhabitants of the area but so, too, is the time or duration of the climatic type in any specified area important. With the army maps used as a base,

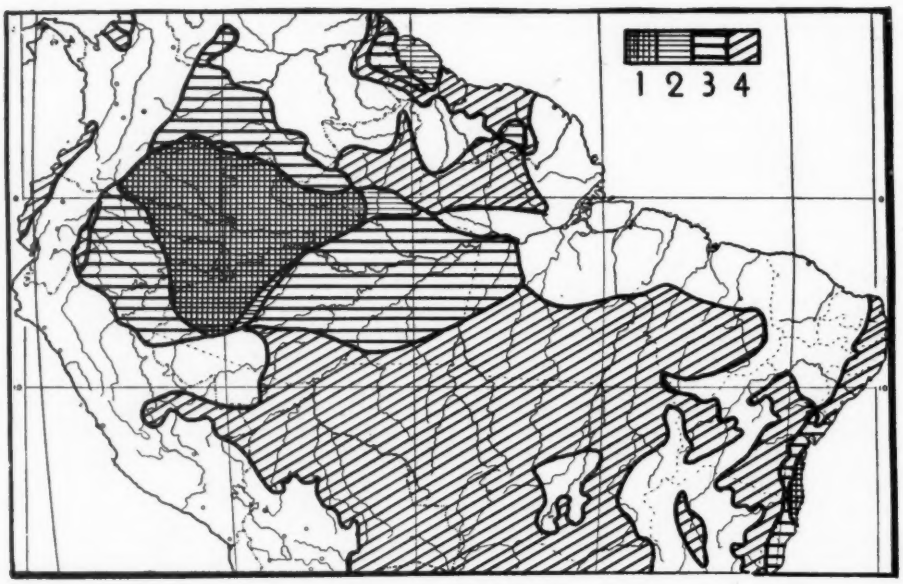


Fig. 2. The Distribution of the Hot and Humid Climatic Type in the Amazon Lowland and Adjacent Territory.
1. Areas Hot and Humid Thruout the Year.
2. Areas Hot and Humid Nine to Eleven Months.
3. Areas Hot and Humid Seven or Eight Months.

the duration of each climatic type was determined. The results are indicated on the three maps reproduced as Figs. 1, 2 and 3.

The Hot and Wet Climate

Only two areas experience a hot and wet climate (Fig. 1). One area is in the interior, bordering along the Peruvian and Ecuadorian boundary. The other area is in the eastern portion along the outlet of the Amazon where 25 per cent of the Amazon Lowland experiences, at least one month each year, a hot and wet

climate. About an eighth of the Lowland, in the east, experiences at least three successive months of this climatic type. No area in the Amazon Lowland experiences a longer period of this type. One-sixth of the Amazon Lowland has a hot and wet climate for at least two successive months.

THE HOT AND HUMID CLIMATE

The northwest section of the Amazon Lowland represents the typical tropical rainforest where isoclimatic conditions prevail

FIG. 3. The Distribution of the Hot and Dry Climatic Type in the Amazon Lowland and Adjacent Territory.
1. Areas Hot and Dry Nine Months.
2. Areas Hot and Dry Five to Eight Months.
3. Areas Hot and Dry Three to Four Months.
4. Areas Hot and Dry One or Two Months.

thruout the year. In an area about one-ninth the size of the Amazon Lowland, there occurs a hot and humid climate for twelve months (Fig. 2). A slightly larger area nearly coincident with the previous one has the same type of climate for nine months of the year. Two-ninths of the area of the Amazon Basin experiences a hot and humid climate for at least seven months, or more than one-half the year. Altho the map does not indicate the situation,

this climatic type is the only one which is common to all the Amazon Lowland for at least one month in a year and is characteristic of proportionally smaller areas as the duration period increases. It is the typical climate of the Amazon Lowland.

The Hot and Dry Climate

The hot and dry climatic type (Fig. 3) is characterized by an average of less than three inches of precipitation per month. This climatic type is experienced for at least one month in eight-ninths of the area. Only in the Northwest corner where the previously-mentioned isoclimatic type prevails does the hot and dry climate fail to penetrate. The area experiencing at least two months of hot and dry conditions is almost synonymous to the area of one month duration. A slight deviation occurs in the northwest corner and along the foothills of the Andes. Two-thirds of the area experiences a hot and dry climate for at least three months of the year with such areas of this length or longer lying primarily to the south of the Amazon. Three-ninths of the area, chiefly along the Fifth Parallel, south, has three months of hot and dry climate.

The greatest duration of this type is five successive months in the south where one-quarter of the Lowland is involved.

AURORAE OF THE SKY

PETER GREENLEAF
Eron Preparatory School, New York City

"Like giant tongues of flame illuminating the polar night during the winter as a compensation for the lack of sunlight, and like a beautiful multicolored sunset; the Aurorae, because of their exceedingly irregular and sudden appearances, their infinitely varied form and superb colors and their flitting motions, have been admired for centuries."

It was not until 1733 when De Mairan first began a really scientific and systematic study of the Aurorae that the various superstitions about the Aurorae began to lose sway. From that date a great deal of energy and skillful labor has been devoted to their study. Then, with the institution of the Birkeland Theory; according to which Aurorae are the result of electric rays emitted from the sun, a new era was opened in the field of Aurorae studies.

Aurorae are electrical phenomena which are caused by electric discharges upon the very highest most rarefied strata of our atmosphere. This seems to be similar to the light which we see in a gas discharge tube. A current of electrons discharged from the sun and rushing unimpeded thru empty space, ionizes the rarefied air and the gas glows for just the same reason as it glows in the discharge tube. Spectrum analysis by Vegard confirm the assumption that the discharges are in air.

Birkeland states that the Aurorae are produced by fairly narrow bundles of electric rays emitted from the sunspot area of the sun (as the intensity varies with the intensity of the sunspot period). Birkeland was able to show that a magnetized sphere when exposed to a stream of cathode rays could only be struck by these rays (electrons) in certain zones around the magnetic axis pole. The mathematical problems set up by Birkeland have been proved by C. Størmer and the results of Størmer's calculations have been confirmed by laboratory experiments carried out by Bruche at the A.E.G. laboratory in Berlin. These calculations give the reasons for the greater abundance of the Aurorae around the magnetic zones of the earth. These zones are the regions where the magnetic storms are most intense and have a radius of about 22° around the geomagnetic axis pole which is longitude 68° west and latitude 78° north approximately. This zone corresponds to that of maximum frequency.

Vegard and Størmer have also propounded arguments in favor of the α particle which is positively charged, as the cause of magnetic disturbances. But, Vegard and Krogness discovered evidence that most Aurorae forms are caused by the negative electrons or β rays. Thus, the general opinion is that the Aurorae appear to be due to α and β rays, in varying proportions in the upper rare atmosphere, shot off from the sun.

The north geomagnetic pole seems to affect the formation of the Aurorae since all the rays of rapidly moving Aurorae are nearly parallel to the lines of magnetic force. The altitude of the Aurorae decrease considerably as they approach the zone of maximum frequency. However, the lower border decreases only about 10°. North of the maximum zone the Aurorae are seen southward most frequently. The seeming convergence of the Auroral rays toward the magnetic zenith and the corona around the magnetic zenith are the effects of perspective. For, here one gets the effect of looking out along parallel bundles of rays which follow magnetic lines of force. These lines are tilted about 15° to 20° southward in the United States so the corona is always south of the true zenith.

About 100 Aurorae per year occur in the northern hemisphere between latitudes 60° and 70°, the maximum zone. They decrease in frequency with a decrease in latitude. Strømer, Vegard and Krogness have measured the height of Aurorae by simultaneously photographing the same Aurorae from two stations against a common background of stars and measuring the parallax obtained. The upper limit varies from 120 kilometers to about 1000 kilometers. Strømer has found both diffuse and rayed Aurorae extending to heights of 1000 kilometers and that Aurorae over 400 kilometers are usually in sunshine.

A most curious and characteristic feature of an Auroral display is the variation in color which means a corresponding change in the spectrum of light emitted. Ordinarily the color is greenish yellow, sometimes bluish white and very often an Aurora shows reddish blue veins in between the ordinary greenish yellow. Every now and then it may be dark red, almost the color of blood. Sometimes it has the form of a diffuse arc, sometimes a pulsating form and all the while long rays passing nearly to the zenith are formed. Vegard thinks that the change in color must be due to change in properties of the cosmic electric rays. Thus, the red rays should appear when the electric rays are moving with such velocity that

they are completely absorbed and the greenish yellow should appear when the greater part of the rays were turned back to space with a large velocity. Red streamers mixed in between ordinary greenish-yellow ones are found because a greater number of rays on the average are completely absorbed in the red streamers and suffer a greater loss of kinetic energy. Gehrche and Seeliger experimented and showed that a red color would be produced when a bundle of cathode rays penetrated into an atmosphere of nitrogen as the velocity of the rays near the bottom edge was gradually reduced on account of absorption.

The various forms which the Aurorae take are exceedingly changeable and like fingerprints no two displays are exactly alike. Sometimes one sees faint, ill defined lights which cover the entire heavens with a beautiful yellowish, greenish, white or rose color. Another type is the clearly defined arcs of uniform brilliance whose extremities touch the horizon. Some of these arcs are elliptical and have a white tinged with yellow color. Groups of arcs are of oscillating brilliancy and have irregular borders from which rays pulsate upwards. The lower edge of the arc exhibits waves. The apparent lengthwise movement of the arc is explained not as a real movement of the arc but as a successive lighting up of its different parts which remain motionless or nearly so. A ray at first faintly luminous suddenly becomes very brilliant for a brief moment and returns to its former state.

Isolated rays which seem to converge upon a point in the sky are the most variable of the Aurorae. The result is a rude crown which is called the "Corona Borealis." The rays have a rapid movement and become very brilliant, take on vivid tints of red, yellow, and green with the red on the bottom, yellow in the center and the green on top. Aurorae which resemble draperies, consist of parallel undulating rays. The lower part is a brilliant rose, tinged with violet which passes into a yellowish white, above which is a bluish or greenish tint.

Thus, bundles of rays come from solar matter of high energy and are brought towards the surface thru the vortex motions in sunspots. These lumps of active matter may emit rays of short wave lengths similar to X rays and give high velocity electrons thru photo-electric action. These rays may be concentrated into bundles by the influence of electrical and local magnetic fields on the sun. These may be neutralized by the positive electrons which are drawn into their tracks by the electrostatic forces and the

streamers of the solar corona are closely related to those bundles which are responsible for northern lights. All of the above result in that beautiful phenomenon, flashing thru the evening sky, the Aurora.

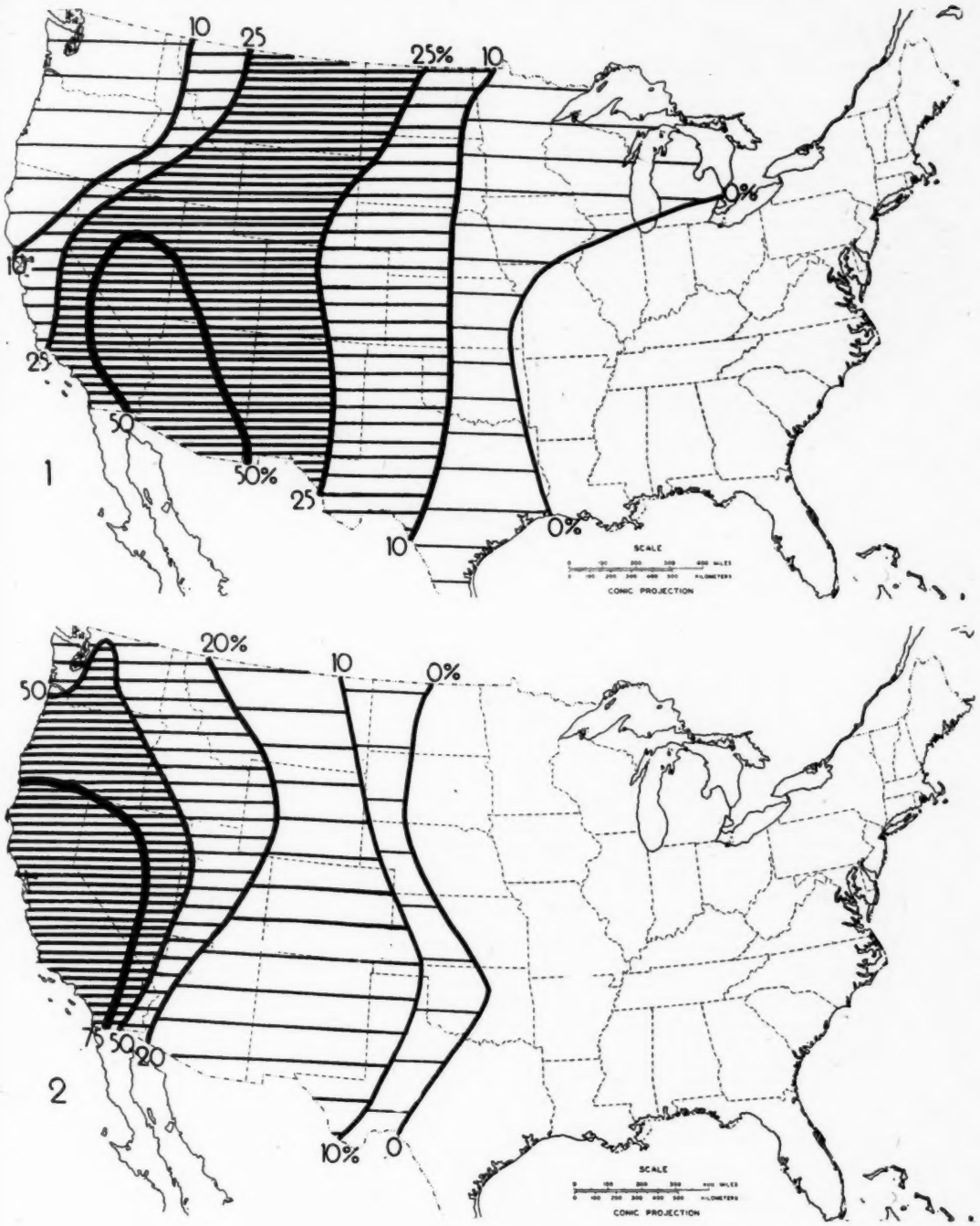
SEASONAL DROUTHS IN THE UNITED STATES

STEPHEN S. VISHER
Indiana University

Every student of our country knows that part of it is arid, and that a considerable region is sometimes dry. It is not widely realized however that some seasons are often dry. The accompanying four maps show the approximate percentage of each of the seasons which are arid. A season which receives a total of less than 3 inches of rainfall in the 3 months is classed as arid. Such a total is at the rate of less than 12 inches a year. Map 1 shows that in only about the eastern third of the country are the springs never very dry. It indicates that in more than a quarter of the country more than a fourth of the springs are very dry. In the most arid section, Nevada and Arizona, more than half of the springs are arid. Arizona, indeed, receives less than an inch of rainfall in about one sixth of the springs. In the driest spring of 52 years Arizona received an average of only 0.4 inch, while Nevada, New Mexico, and southern California received about an inch, the Dakotas about 2 inches, Iowa about 4 inches, New York and Florida about 5, Pennsylvania, Indiana and Louisiana about 6, and Tennessee and North Carolina about 7.

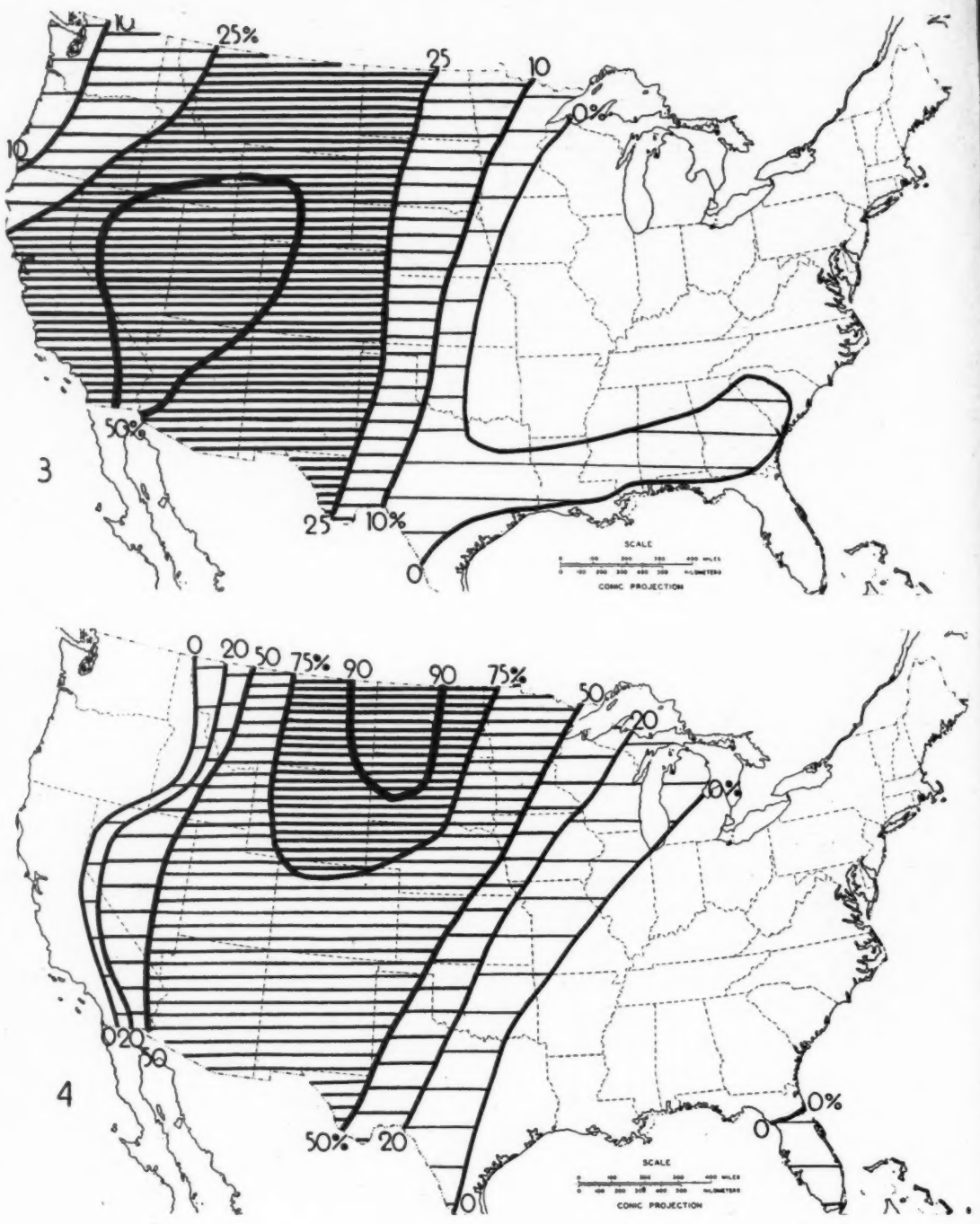
DRY SUMMERS

Dry summers are even more harmful than dry springs, except where irrigation is practiced. Map 2 shows that all of the eastern half of the country receives 3 inches or more as state averages, but that on the Pacific coast more than half of the summers are arid, in California more than three-fourths of them. Indeed about a fourth of the summers are almost rainless in California and Nevada, receiving less than an inch of rainfall. In the driest summer of 52 years California's average was only one-tenth of an inch and the 7 most western states received less than an inch. The states from North Dakota to Texas received from 2 inches on their



Map Legend

1. Percentage of the springs which receive less than 3 inches of precipitation
2. Percentages of the summers which are arid



3. Percentages of the autumns which are very dry
4. Percentages of the winters which receive less than 3 inches of precipitation

western borders to about 4 inches on their eastern borders in this driest summer, Illinois and Arkansas received about 5 inches, and most of the states on the Atlantic coast received 6 to 8 inches. It is interesting to note that Florida in its driest summer of 52 years received 159 times as much rain as did California in its driest summer.

DRY AUTUMNS AND WINTERS

Map 3 shows that very dry autumns are lacking in the northeastern third of the country and occur only occasionally in the southeast and extreme northwest. In a large western region, however, more than one-fourth of the autumns receive less than 3 inches of precipitation. A sizable area centering in Utah normally has such dry autumns, since they occur in more than half of the years. In Nevada one-fifth of the autumns receive less than an inch of precipitation and in six other states, extending from Montana to California, arid autumns occur in 2 to 6 per cent of the years. In the driest autumn of 52 years, California and Nevada received less than a half inch, Montana, Wyoming, Utah and Arizona less than an inch, and all but the northeastern third of the country and Florida less than 3 inches.

Map 4 shows that winters during which less than 3 inches of precipitation is received are lacking only on the Pacific coast and in the East north of Florida. In more than a third of the country, such dry winters occur in more than half of the years, and in the northern Great Plains they occur in about four-fifths of the years. Indeed winters with a total precipitation of less than an inch occur in about a seventh of the years in North Dakota and about half that often in Arizona and New Mexico. In the driest winter of 52 years, totals of less than an inch were received in a large region extending from Mexico to Canada and from Lake Superior to Idaho and central Texas to California. The states within about 200 miles of the Atlantic coast received, however, from 5 to 6 inches in their driest winter, except Florida, which got less than 3 inches. The 159 to 1 contrast between Florida and California rainfall in their driest summers, already commented on, may be contrasted with the situation in dry winters, when California receives nearly twice as much rain as Florida. (In dry springs and falls, Florida receives about twice as much rain as does California.)

EDITORIAL NOTES AND NEWS

A recent publication of the Department of Immigration and Colonization of the Canadian Pacific Railway reports that capital investment in Canadian fur farms is well over forty million dollars. The following are illustrative of some of the top prices paid at recent auction sales for wild as well as ranch pelts: mink pelts, $67.50; marten, $160.00; fisher, $185.00; platinum fox, $230.00. Muskrat skins, from which Hudson Seal is made, sold as high as $4.70 a pelt. A mink coat made of top price pelts would cost around ten thousand dollars as the skins alone would be half that amount and the remaining cost would be due to the sewing and styling, insurance, reasonable profit, and a twenty-five per cent government tax in Canada. Canada also imports a large quantity and variety of furs from various parts of the world, such as Persian lamb, rabbit fur, squirrel skins, raccoon, and opossum.

The National Geographic Society, Washington 6, D.C., continues its publication of weekly *Geographic School Bulletins* at nominal cost thruout the school year. As usual, each bulletin of the weekly issue features pertinent and timely news dealing with places, peoples, and new developments in the various parts of the world.

A G. I. helmet may be the answer to the native, who, when picking up the fallen pods of the Brazil nut trees, faces the risk of being hit by the falling pods. A pod of nuts may weigh up to four pounds and may fall from a height of over a hundred feet. Each pod may contain from twelve to twenty nuts. Most pods are collected from wild trees as only a few plantations have been started.

DR. DAN STANISLAWSKI, formerly of the University of California, has accepted a position as assistant professor of geography at the University of Washington, Seattle. His special field is Latin America.

MARY VIOLA PHILLIPS, head of the high school department of geography, New Kensington, Pennsylvania, writes that she has four classes of seniors taking Global Geography and one of juniors taking Geography of the Americas. This is almost double the number of classes taught by her last year and is indicative of the increasing interest high school students have in geography when presented by instructors with adequate preparation in the field of geography. Articles by Miss Phillips appear in the September and November issues of the JOURNAL OF GEOGRAPHY, and another will appear in a forthcoming number.

THOMAS F. BARTON, Head of the Department of Geography, Southern Illinois Normal University, Carbondale, Illinois; Margaret Means, Instructor in Geography, Bloomington High School, Bloomington, Illinois; and E. H. Reeder, Professor of Education, University of Illinois, were members of a panel of eleven persons who presented a symposium dealing with Curriculum Changes to Meet Postwar Needs. Two of the five topics in the discussion dealt with Global-Human Geography, and Conservation. The discussion was a part of the program presented at the Conference of the Illinois High School Principals' Association which met in October at the University of Illinois.

GEOGRAPHICAL PUBLICATIONS

Paul A. Siple, and others: **Scientific Reports of the United States Antarctic Expedition, 1939-1941.** Am. Philosophical Soc. Proceed. Vol. 89(1), 1945. Pp. 402; many photos, diags., maps. Philadelphia, 1945. 75 cents.

This volume contains about 30 reports by members of Admiral Byrd's third Antarctic expedition. Of these, 10 are geographic or weather, 13 are geologic, 3 biologic; mostly finely illustrated. Of special interest to geographers are the reports of Dr. Siple, the expedition's geographer, on exploration, clothing, and on the cooling effects of cold air. Of geographic interest also is a chapter by R. G. Frazier on effects of the cold on the human body. The many excellent photos are of general interest, as are parts of most of the reports. This scholarly volume, with its many references to other reports on the Antarctic, was sent to the JOURNAL for review. The foregoing brief statement reports its availability to those seeking such information as it affords.

STEPHEN S. VISHER

Indiana University

Roderick Peattie, **Look to the Frontiers,** New York, Harper and Brothers, 1944, 246 pp. $3.00.

In his *Look to the Frontiers,* Roderick Peattie asks his readers to examine the geographic foundations to a lasting peace. Modern wars, he asserts, are consequent upon nationalistic competition and are frequently fought over boundaries. Therefore, we should "let the people know" some facts of geography to help them better to judge the proposals for peace.

It is well known that from the beginning of history boundaries between nations have led to wars. Yet boundaries are man-made; Nature does not recognize arbitrary boundary lines. In order to have a peace that will last we must use far greater intelligence in boundary-making than we ever have in the past. For centuries, boundaries have been *political*—lines of defense—and hence arbitrary. Boundary *lines* bring different and opposing dynamic nationalisms into the closest possible contact with each other, stimulating border incidents pregnant with war. The *line* is always under pressure. Particularly it is wrong to draw a boundary line if it divides in two a single economic earth unit. While Peattie did not mention it as an example, the French-German boundary line between Lorraine iron ore and Ruhr coal flashed to the reviewer's mind. Certainly this danger spot was not Nature's doing.

Correctly Peattie emphasizes everybody's need of geography: says he *"One World* would not have been so surprising a book had not ignorance been so prevalent." He then goes on to show that the new map-makers [the statesmen] must know some geography, for geography is the most basic of all the elements which go to make up history. If peace is to endure, it must be a peace which understands man's relation to the earth which he tills or mines. Yet our ignorance of geography is so appalling that it leads to intolerance and even to hatred. Rather than understand a foreign *ism,* "we shut our minds to its existence by closing our frontiers against it."

Peattie believes that world strong points, such as Gibraltar and Pearl Harbor should be internationalized. Says he:

"The Strait of Gibraltar is the greatest commercial water gut in the world—a most important element in British sea power. Would Britain ever consent to relinquish it to world supervision? From the point of view of sovereignty it is claimed by Spain. Presumably Britain holds it, in theory at least, in order to preserve freedom of the seas. This is done at great cost, and the cost as well as the responsibility should be borne

by all. The fact that the strait is also an element of naval power will be of no avail to Britain if we are to have a single world police force."

It would appear that the author has something here that might be a possible step toward world peace. He handles navigable rivers in much the same way.

He is for *zonal boundaries* as opposed to *line boundaries:* ". . . if a zone boundary is established at a point of tension, its width may be sufficient so that national expansion tendencies may expend their force before they come into contact with an opposing nationalism."

Some of the international problems posed by air transportation are discussed. Air sites should be internationalized and there must be a guarantee of the freedom of the skies.

A stimulating discussion of the "life and death of geopolitics" is presented. Many will agree with what is said. This reviewer, however, believes that too little attention has been paid to the fact that there are two brands of geopolitics and that the subject should not be damned because the Germans made *geopolitik* a pseudo-science: to be sure, with *geopolitik* they tried to *justify* their acts of aggression and tyranny. Haushofer laid down the blueprint of conquest. The world must never condone these acts. In the United States and Great Britain, however, we can and should make *geopolitics* a rational science. When the thoughtless inveigh against geopolitics, they should designate whether they mean the Mackinder or the corrupted Haushofer brand.

Whether the reader agrees with Peattie or not [and few will on all points], it must be confessed that the volume is readable, suggestive, thought-provoking, and interesting. Between the volume's covers is much good "horse sense" and a sound background for a better comprehension of the many subtle problems of international relations. Few geographers in this country or any other can rival Peattie in the art of writing: few scientific writers in any field are his peer. One or two of his cameos from *Look to the Frontiers* are:

"We live so close together that a fire in any man's house threatens the whole community."

"The term 'globaloney' was more than 'luce' talk, it was politically malicious."

Langdon White

Stanford University

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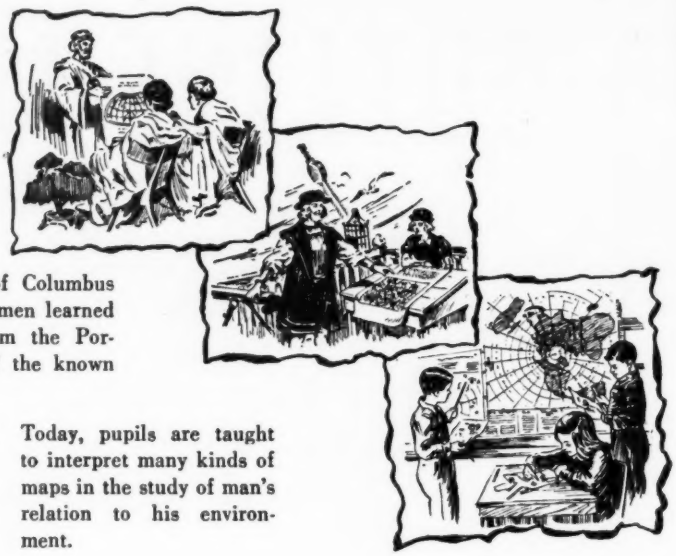

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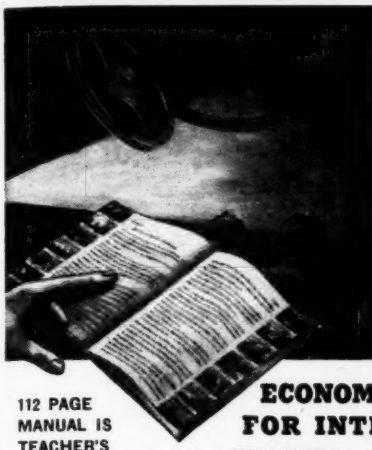

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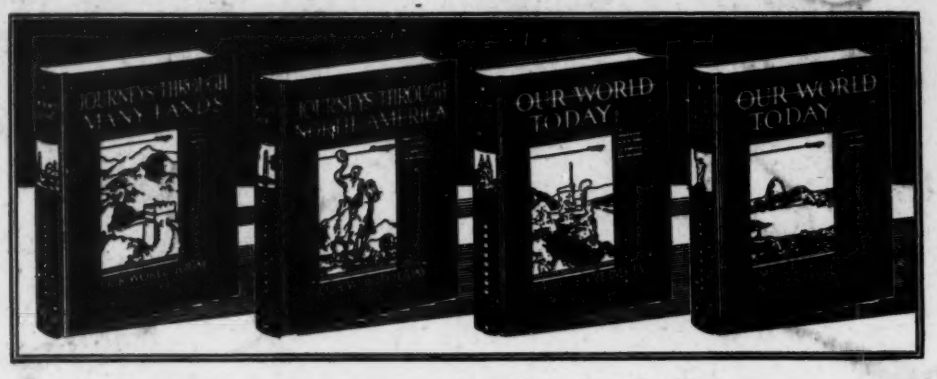

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